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7th Army LandWarNet

Training and Readiness Oversight (TRO)

by

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A Research Report Submitted to the Faculty
In partial Fulfillment of the Graduation Requirements

12 February 2009

Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
FEB 2009	**N/A**	**-**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
7th Army landWarNet Training and Readiness Oversight (TRO)	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Air War College, Maxwell Air Force Base, Alabama**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release, distribution unlimited

13. SUPPLEMENTARY NOTES
The original document contains color images.

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**SAR**	**47**	

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Contents

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(Biography)

Colonel Dana S. Tankins received an ROTC scholarship at the Pennsylvania State University and graduated with a Bachelor of Science in Electrical Engineering. Upon graduation he was commissioned into the U.S. Army Signal Corps in 1988. He is a graduate of the Signal Officer Basic Course (1988), the Signal Officer Advanced Course (1992), the Communications and Electronics Staff Course (1993), the U.S. Army Command and General Staff College (2000), and JPME Level II, Joint Forces Staff College (2003). He has a Masters of Arts in Telecommunications Management from Webster University.

COL Tankins is currently attending the Air War College at Maxwell Air Force Base, Alabama. His previous assignments include G3, 5th Signal Command (Theater), Manheim, Germany (2007-2008); Commander and Deputy Commander, 7th Signal Brigade, 5th Signal Command, Manheim, Germany (2006-2007); Commander, 121st Signal Battalion and G6 for the 1st Infantry Division, Wurzburg, Germany (2005-2006); Chief, Tactical Radio Branch, J6 Modernization Division, Center for Special Operations Networks and Communications, U.S. Special Operations Command (USSOCOM), MacDill Air Force Base, Florida (2003-2005); Operations Officer, Executive Officer, and Rear Detachment Commander, 112th Special Operations Signal Battalion (Airborne), Fort Bragg, North Carolina (2001-2003); Group Signal Officer, 3d Special Forces Group (Airborne), Fort Bragg, North Carolina (2000-2001); Operations Officer, Communications Squadron, United States Army Office of Military Support, Washington, D.C. (1997-1999); Commander, Delta Company, 122d Signal Battalion and Radio Officer, Division G6, 2d Infantry Division, Camp Red Cloud, Korea (1996-1997); Regimental Signal Detachment Commander and Regimental Signal Officer, 75th Ranger Regiment (Airborne), Fort Benning, Georgia (1993-1996); Battalion Signal Officer, 4th Battalion, 3d Field Artillery Regiment, 2AD (FWD), Garlstedt, Germany (1989-1992); and Communications Platoon Leader and Headquarters and Headquarters Battery Executive Officer, 4th Battalion, 3d Field Artillery Regiment, 2AD (FWD), Garlstedt, Germany (1988-1989).

COL Tankins' badges include the Ranger Tab, Master Parachute Badge, and Pathfinder Badge. His awards include the Bronze Star Medal, Defense Meritorious Service Medal with one Oak Leaf Cluster, Meritorious Service Medal with five Oak Leaf Clusters, Army Commendation Medal with two Oak Leaf Clusters, Joint Service Achievement Medal with two Oak Leaf Clusters, and Army Achievement Medal with six Oak Leaf Clusters.

COL Tankins is married to the former Joy Nowell from Columbus, Georgia; they have two children; Bayley and Sydney.

Introduction

The 7th Army LandWarNet (LWN) is the Army network in Europe and a "net-centric"[1] system which cuts across the United States Army Europe/ 7th Army (USAREUR/7A) vertical command authorities and echelons of organizational structure.[2] Training and readiness oversight (TRO) is inherent to command authority; executed through the vertical chain of command; and is command focused and organizationally based. The 7th Army LWN is not an organization but a system spanning many echelons. Consequentially, who is providing end-to-end TRO of an expanding and transforming network?

To fully understand the connections and disconnects of "end-to-end TRO of the network", the two components of TRO and the 7th Army LWN must be analyzed to understand the relationship between TRO of the network, and the network. The first component of TRO is command authority which designates a commander as the responsible agent for TRO. The second component is organizational structure and functions which are the methods in which a commander executes and oversees the TRO process. In addition, it is critical to understand how a series of small networks, each under one commander and organization, expanded and merged to form a single and centralized Army network in USAREUR/7A. The TRO process and the network were once aligned under the same command authorities and organizational structures, but now fall under numerous and separate command authorities and organizations- TRO of the network and the network are disconnected.

This study establishes the connections and disconnects between the two components of TRO and the network, then synthesizes the differences through a holistic view of command authority, organizational structure and functions, and the network. Chapter One (The

Connections) establishes the connections between command authority, and organizational structure and functions involved with both TRO and the network. Chapter Two (The Disconnects) identifies disconnects between command authority, and organizational structure and functions involved with both TRO and the network. This chapter also focuses on the nexus where the command and organizational structures of TRO and the network collide. Chapter Three (Recommendations- The Way Ahead) takes a holistic view of TRO of the network and the network, and synthesizes the differences to recommend an effective network TRO process and way ahead. Finally, Chapter Four (Summary), summarizes the connections, disconnects and the way ahead for USAREUR/7A, the Army, and the Department of Defense (DoD) for network TRO, suggesting how a properly synthesized, holistic view of the problem will resolve many of the differences.

Chapter One (The Connections)

Command Relationships and Authority

The 7th Army LWN is a subset of the Army LWN. The Army LWN is a subset of the DoD Global information Grid (GIG) and spans across command authorities. Included in these authorities are TRO. This section will define command relationships and authorities of the organizations which provide oversight of the 7th Army LWN. Command is defined by Joint Pub 0-2, as "The authority that a commander in the Armed Forces lawfully exercises over subordinates by virtue of rank or assignment. Command includes the authority and responsibility for effectively using available resources and for planning the employment of, organizing, directing, coordinating, and controlling military forces for the accomplishment of assigned missions."[3] Command authority is executed through the established chain of command.

The level of command authority is based on four types of command relationships; combatant command (COCOM), operational control (OPCON), tactical control (TACON) and support; and are further clarified by four types of authority outside command relationships: administrative control (ADCON), TRO, Coordinating Authority, and direct liaison authorized (DIRLAUTH).[4] The authorities which impact the 7th Army LWN are COCOM, OPCON, ADCON and TRO.[5] To understand TRO as it applies to the 7th Army LWN, it is important to understand these terms. Joint Pub 1 defines COCOM as:

> Nontransferable command authority established by title 10 ("Armed Forces"), United States Code, section 164, exercised only by commanders of unified or specified combatant commands unless otherwise directed by the President or the Secretary of Defense. Combatant command (command authority) cannot be delegated and is the authority of a combatant commander to perform those functions of command over assigned forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction over all aspects of military operations, joint training, and logistics necessary to accomplish the missions assigned to the command. Combatant command (command authority) should be exercised through the

> commanders of subordinate organizations. Normally, this authority is exercised through subordinate joint force commanders and Service and/or functional component commanders. [6]

The 7th Army LWN and the organizations which support the network fall under the COCOM of a regional combatant commander- Commander, United States European Command (COMUSEUCOM), and a functional combatant commander- Commander, United States Strategic Command (COMUSSTRATCOM). The next command relationship involving the 7th Army LWN and its supporting organizations is OPCON. Joint Pub 1 defines the command relationship of OPCON as:

> Command authority that may be exercised by commanders at any echelon at or below the level of combatant command. Operational control is inherent in combatant command (command authority) and may be delegated within the command. Operational control is the authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. Operational control includes authoritative direction over all aspects of military operations and joint training necessary to accomplish missions assigned to the command. Operational control should be exercised through the commanders of subordinate organizations. Normally this authority is exercised through subordinate joint force commanders and Service and/or functional component commanders. Operational control normally provides full authority to organize commands and forces and to employ those forces as the commander in operational control considers necessary to accomplish assigned missions; it does not, in and of itself, include authoritative direction for logistics or matters of administration, discipline, internal organization, or unit training.[7]

As defined above, OPCON is inherent to COCOM and may be delegated within the command usually to joint force, Service, and functional component commanders.

The next authority involving the 7th Army LWN and its supporting organizations is ADCON. Joint Pub 1 defines ADCON as:

> Direction or exercise of authority over subordinate or other organizations in respect to administration and support, including organization of Service forces, control of resources and equipment, personnel management, unit logistics, individual and unit training, readiness, mobilization, demobilization, discipline, and other matters not included in the operational missions of the subordinate or other organizations.[8]

ADCON is inherent to the command authority a commander has over organic forces and includes the authority and responsibility for training. OPCON does not affect ADCON unless specifically added to OPCON. For example, if a battalion is OPCON from a parent brigade to a host brigade, the parent brigade still has ADCON and is responsible for the training of that battalion unless specified otherwise.[9]

The last authority is TRO which is inherent to the command authority a commander normally exercises over organic, assigned, or attached forces in regards to training and readiness, and is also inherent to ADCON.[10] Joint Pub 1 discusses TRO in terms of the authority a combatant commander has over reserve component (RC) forces, but also states "Combatant commanders normally will exercise TRO over assigned forces through the Service component commanders."[11] TRO is a senior commander's authority to: provide guidance on operational requirements and priorities; provide guidance and oversight on training and readiness; resource training; review readiness reports; and conduct training and readiness inspections.[12] Based on these definitions, USEUCOM, USSTRATCOM, USAREUR/7A, United States Army Space and Missile Defense Command and Army Strategic Command (USASMDC/ARSTRAT), U.S. Army Network Enterprise Technology Command/9th Signal Command (Army) (NETCOM/9th SC (A)), and the 5th Signal Command all have authority which impacts the 7th Army LWN.

COMUSEUCOM has COCOM authority over USAREUR/7A, but delegates OPCON authority to USAREUR/7A over all Army forces in the EUCOM area of responsibility (AOR). AR 10-87 states:

> USAREUR exercises ADCON authority and responsibility on behalf of the SA and exercises OPCON over Army forces, as delegated by the Commander, USEUCOM (COMUSEUCOM) throughout the USEUCOM area of responsibility (AOR)…. the Commander, USAREUR is responsible to the SA for execution of assigned responsibilities contained in Title 10 USC 3013(b).[13] [14]

USAREUR/7A also acts as the Army Service Component Commander (ASCC) for all Army organizations in the EUCOM AOR, shares ADCON with NETCOM/9th SC (A) with respect commander's comments on the 5th Signal Command unit status report (USR), and coordinates with NETCOM/9th SC (A) in regards to operational base communications infostructure.[15]

NETCOM/9th SC (A) is a direct reporting unit (DRU) to the Army Chief Information Officer (CIO)/G6 and is the Army agency responsible for all aspects of the Army LWN to include technical authority, enterprise level oversight, NetOps, engineering, and policy and procedures. NETCOM/9th SC (A) shares ADCON with the ASCC over the respective subordinate NETCOM/9th SC (A) theater signal commands. NETCOM/9th SC (A) delegates its LWN responsibilities to the subordinate theater signal commands for the portion of the LWN in each respective theater.[16] [17] In the area of NetOps, the NETCOM/9th SC (A) Commander assumes the delegated authority from USASMDC/ARSTRAT as the USASMDC/ARSTRAT deputy for Army NetOps and coordinates directly with USSTRATCOM in this capacity.[18]

COMUSSTRATCOM has COCOM over the Joint Task Force for Global Network Operations (JTF-GNO); which is USSTRATCOM's lead agency to conduct global NetOps across the GIG.[19] "COMUSSTRATCOM has the overall responsibility for global network operations (GNO) and defense in coordination with the Chairman of the Joint Chiefs of Staff (CJCS) and other combatant commands."[20] USSTRATCOM also has COCOM authority over USASMDC/ARSTRAT, which acts as the ASCC for USSTRATCOM.[21] One of USSTRATCOM's primary missions is to provide GIG NetOps. "The UCP 2006 states that USSTRATCOM shall be responsible for planning, integrating, and coordinating DoD global

network operations by directing GIG operations and defense and identifying and advocating these desired characteristics and capabilities."[22]

One of USASMDC/ARSTRAT's primary missions is NetOps of the LWN in which the NETCOM/9th SC (A) Commander is designated as the USASMDC/ARSTRAT deputy for NetOps.[23] The Army Global Network Operations and Security Center (A-GNOSC) is designated as the lead Army Agency for NetOps where USASMDC/ARSTRAT has OPCON authority over the A-GNOSC, and NETCOM/9th SC (A) has ADCON authority over the A-GNOSC.[24] "Through the A-GNOSC, NETCOM/9th SC (A) is responsible for global NETOPS and CND actions across the entire Army LWN."[25] [26] The A-GNOSC provides support to the 5th Signal Command, European Theater Network and Security Center (E-TNOSC) for NetOps issues.

The 5th Signal Command is a subordinate signal theater command under NETCOM/9th SC (A), but is forward deployed in the EUCOM AOR and OPCON under USAREUR/7A.[27] NETCOM/9th SC (A) has ADCON over 5th Signal Command but shares ADCON with USAREUR/7A over 5th Signal Command's unit status report (USR).[28] NETCOM/9th SC (A) is the single Army authority over the Army's LWN and delegates this authority to 5th Signal Command for the 7th Army LWN.[29] The Commander, 5th Signal Command is dual hatted as the USAREUR/7A CIO/G6.[30] The 5th Signal Command E-TNOSC has a supporting and supported relationship with both the Defense Information Systems Agency (DISA) European Theater NetOps Center (TNC) and the A-GNOSC on NetOps issues across the LWN and the GIG.[31]

The Commander, 5th Signal Command exercises command authority over 5th Signal Command with TRO inherent to command authority; and in the role as the USAREUR/7A CIO/G6 exercises staff coordination and oversight on all USAREUR/7A subordinate units for all command, control, communications, computers, and information management (C4IM) matters

on behalf of the USAREUR/7A Commander.[32] This includes C4IM TRO responsibilities for USAREUR/7A subordinate units outside of the 5th Signal Command chain of command. The Commander, 5th Signal Command balances command authority; CIO/G6 C4IM policy authority; and network technical authority across two echelons of command. In addition, 5th Signal Command is a subordinate organization to the USAREUR/7A, and the respective staffs work at two separate echelons although network issues span both echelons and organizations. Command authority and relationships connect TRO authority and the 7th Army LWN, but organizational structure and functions link the execution of training and readiness oversight with the network.

Organizational Structure and Functions

There is a direct connection between organizational structure and functions and TRO of the 7th Army LWN. NETCOM/9th SC (A), USAREUR/7A, and 5th Signal Command are directly connected to TRO of the 7th Army LWN. In 2002, the Army focused on establishing a single Army enterprise network integrated with the GIG. To support this effort, the Department of Army published General Order #5, dated 11 July 2002, to reorganize and redesignate the Army Signal Command (ASC) to NETCOM/9th SC (A).[33] AR 10-87 states:

> NETCOM/9th SC (A) is the single authority to operate, manage, and defend the Army's information structure (infostructure) at the enterprise level. NETCOM/9th SC (A) executes communications capabilities to enable Joint and combined battle command, while operating, transforming, and defending the Army's LandWarNet (LWN) Enterprise.[34]

The primary functions of NETCOM/9th SC (A) include: LWN NetOps; development, implementation, and enforcement of LWN policy and procedures; authoritative enterprise oversight of the LWN; operation, sustainment, defense, and engineering of the LWN through the subordinate Army theater signal commands; integration and synchronization of the LWN with the GIG; establishment and enforcement of reporting procedures for all organizations connected to the LWN; oversight of all Directorates of Information Management (DOIMs); oversight authority of the LWN enterprise architecture; management of the Army C4IM program; and command oversight on all subordinate commands.[35] NETCOM executes its global LWN NetOps mission through the AGNOSC to theater NOSCs, and its enterprise system management (ESM) through the Enterprise Systems Technology Activity (ESTA).[36] NETCOM/ 9th SC (A) delegates the responsibility for these functions in each theater to its subordinate signal commands.[37]

The NETCOM/9th SC (A) subordinate theater signal commands include: 7th Signal Command (Theater) which supports United States Forces Command (FORSCOM) and United States Joint Forces Command (USJFCOM); 311th Signal Command (Theater) which supports United States Army Pacific (USARPAC) and United States Pacific Command (USPACOM); 335th Signal Command (Theater) which supports United States Army Central (USARCENT) and United States Central Command (USCENTCOM); and the 5th Signal Command (Theater) which supports USAREUR/7A and USEUCOM.[38] USAREUR/7A's primary function "is an operational level Army force, designated by the SA, comprised primarily of operational organizations and serving as the ASCC of JFLCC/JTF capable headquarters to support the COMUSECOM requirements for command and control of joint and/or coalition forces."[39]

USAREUR/7A is currently transforming to 7th Army which impacts the mission and functions of the 5th Signal Command (Theater). Under this transformation, USAREUR/7A Headquarters merges functions with V Corps to establish 7th Army Headquarters as a Title-10 ASCC which acts as an operational and warfighting headquarters.[40] As part of the transformation V Corps will inactivate and the two divisions under USAREUR/7A will redeploy back to CONUS. This will leave USAREUR/7A with several combat support (CS) and combat service and support (CSS) major subordinate commands (MSCs), including 5th Signal Command (Theater), and four modular combat brigades which can deploy and plug into any higher headquarters with their organic joint network node (JNN) tactical satellite systems.[41] As part of this transformation, the corps signal brigade and two divisional signal battalions inactivated, leaving 5th Signal Command with the only tactical signal brigade and battalion force structure under USAREUR/7A.[42] [43] [44] This is critical because the corps and division where responsible for the C4IM TRO of their respective subordinate brigades.

Although the USAREUR/7A transformation to 7th Army is not complete, most of the Subordinate Army elements have completed or are well into the transformation process including 5th Signal Command.[45] 5th Signal Command's mission statement to "provide and defend integrated Theater, Joint and Combined global network operations, enabling battle command for all Warfighters"[46] directly supports this transformation. Collectively, 5th Signal Command and the USAREUR/7A CIO G6 have three primary functions. First, to plan, engineer, install, operate, sustain, secure, defend, and train the 7th Army LandWarNet; second, to act as the single C4IM service provider for USAREUR/7A; and finally, to provide policy, oversight, and support in all C4IM areas throughout USAREUR/7A.[47] To effectively execute these functions the Commander, 5th Signal Command is also dual-hatted as the USAREUR/7A CIO/G6.[48]

To carry out these functions the Commander, 5th Signal Command oversees the USAREUR/7A CIO/G6; the 5th Signal Command Headquarters; the 2d Signal Brigade (which consists of six operational base signal battalions); and the 7th Signal Brigade (which consists of two tactical signal battalions). The mission of the USAREUR/7A CIO/G6 is to:

> Provide technical advice and guidance on Information Management (IM) to the Army in Europe (AE); provide theater-wide leadership, management, and oversight of the IM area (automation, information assurance (IA), telecommunications, and visual information); develop and implement policy, plans, projects, and programs to meet the IM and Information Technology (IT) requirements of the Army in Europe.[49]

The focus of the USAREUR/7A CIO/G6 is on warfighter C4IM issues dealing with network and non-network C4IM requirements. The CIO/G6 executes and enforces USAREUR/7A C4IM policy on behalf of the Commander, USAREUR/7A.

The primary functions of the USAREUR/7A CIO/G6 include; oversight on all USAREUR/7A contracts for C4IM equipment and services through the Theater IT Business Office (TBO); oversight on the Theater Operational Level Agreement (OLA) in support of the

Single DOIM Action Plan (SDAP) which designates 5th Signal Command (Theater) as the single C4IM service provider for the Army in Europe; coordination and synchronization with EUCOM, NETCOM/9th SC (A), Installation Management Command (IMCOM), and DISA on C4IM issues; develop, coordinate, and oversee the execution of Annex-K (signal) for USAREUR/7A OPORDs; interface with the USAREUR/G3 and 5th Signal Command on warfighter frequency, network, and authority to connect requirements; and execute TRO functions for C4I issues on behalf of the USAREUR/7A Commander.[50]

The USAREUR/7A CIO/G6 supports the USAREUR/7A Commander's execution of TRO in the following areas; C4IM training and exercise support for subordinate USAREUR/7A commands; oversight and coordination of C4IM resources for subordinate commands; attend MSC quarterly/semi-annual training briefs to USAREUR/7A as the commander's C4IM representative; provide oversight on MSC unit status report (USR) submissions on C4IM issues; and provide observer controller (OC) and inspectors as part of the USAREUR/7A mission in verification exercises, operational readiness inspections (ORIs) and command inspection programs (CIPs).[51] The USAREUR/7A CIO/G6 supports all three of the 5th Signal Commander's primary functions and acts as the liaison between the warfighter, USAREUR/7A and 5th Signal Command.

The 5th Signal Command Headquarters staff agency responsible for operations and training of the 7th Army LWN is the 5th Signal Command G3. The mission of the 5th Signal Command G3 is to:

> Engineer, install, manage, document, and protect the Army network in Europe while simultaneously planning for and executing current, contingency, and future operations in support of joint, combined, and expeditionary missions throughout the United States European Command area of responsibility, in order to facilitate battle command for the United States Army, Europe Commander.[52]

The 5th Signal Command G3 Directorate consists of- the Operations Division; Plans and Engineering Division (P/E); and the Enterprise Service Office (ESO).[53] The G3 Operations Division is responsible for all 5th Signal Command plans, exercises, operations, training, and readiness as they apply to both 5th Signal Command subordinate elements and the 7th Army LandWarNet.

The G3 is the 5th Signal Commander's responsible agent to support, resource, and oversee training requirements; assist in the preparation of the commander's training guidance; manage and provide oversight on the training calendar, quarterly/ semiannual training briefs (QTBs), and the unit status report (USR) process.[54] The Deputy Commander, 5th Signal Command oversees the operational inspection program (OIP) and command inspection program (CIP).[55] The G3 also provides oversight on all aspects of the 7th Army LWN; coordinates, develops, and provides oversight on the execution of plans and orders for subordinate 5th Signal Command organizations and 5th Signal Command's portion of the 7th Army LWN to include 2d Signal Brigade and 7th Signal Brigade. However, the 5th Signal Command interface to support, connect, and provide training for non 5th Signal Command network users begins with approval from the USAREUR/7A CIO/G6 and the USAREUR/7A G3.[56]

. The P/E Division, G3, 5th Signal Command is responsible for network enterprise planning, engineering, fielding, integration, testing and management of the 7th Army LWN. The P/E Division is responsible for all network life-cycle upgrades and technology insertions.[57] Finally, the ESO, G3, 5th Signal Command directly supports the function of USAREUR/7A's C4IM single service provider. The ESO oversees the network enterprise information technology infrastructure library (ITIL) business model; coordinates with the TBO to provide service level management (SLM) and capacity management (CM) agreements with garrisons, units, and

headquarters.[58] Each of the six operational base signal battalions assigned to 2d Signal Brigade provide network enterprise support to a specific USAREUR/7A region and have an ESO representative assigned to oversee SLM and CM for the warfighters and customers in their respective regions.[59]

The 7th Signal Brigade provides theater level tactical signal support to USAREUR/7A and acts as 5th Signal Command's tactical arm of the 7th Army LWN. "The primary mission of the 7th Signal Brigade is to provide tactical communications support to the warfighter, completing the connection from the front line to the Global Information Grid."[60] 7th Signal Brigade is the expeditionary arm of the 5th Signal Command and consists of a headquarters and two expeditionary signal battalions (ESBs); the 44th ESB and the 72d ESB. The 7th Signal Brigade's primary functions include providing tactical transport, tactical NetOps, and C4IM services to tactical formations and command posts.[61] The 7th Signal Brigade Commander provides TRO over the two subordinate battalions.

2d Signal Brigade provides theater level operational base and strategic transport, C4IM services and NetOps over the 7th Army LWN.[62] 2nd Signal Brigade "provides the information technology operational base and network management services to ensure information dominance to the warfighter throughout the USAREUR/7A area of responsibility."[63] 2d Brigade consists of a headquarters, the European Theater Network Operations and Security Center (E-TNOSC) and six regionally aligned operational base signal battalions: the 39th Signal Battalion (Benelux), 43d Signal Battalion (Heidelberg), 52d Signal Battalion (Stuttgart), 69th Signal Battalion (Grafenwoehr), 102d Signal Battalion (Hessen), and 509th Signal Battalion (Vicenza).[64] 2d Signal Brigade owns and operates the operational base and strategic infostructure of the 7th Army LWN. The six operational base signal battalions provide oversight on the 7th Army LWW in

their regions and provide oversight on C4IM services to the warfighters and headquarters in their regions. The 2d Brigade Commander provides TRO over the six battalions and E-TNOSC.

Army FM 6-0, Mission Command: Command and Control of Army Forces, states:

> Commanders establish and maintain control with a structure. As an element of control, *structure* is a defined organization that establishes relationships among its elements or a procedure that establishes relationships among its activities……. C2 consists of two components: the commander and his C2 system. Commanders use their command and control systems to exercise C2 over forces to accomplish missions.[65]

Organizational structure and functions act as the control mechanism a commander utilizes to implement command authority- including TRO. Based on this, both organizational structure and functions, and command authority are connected to TRO and the network. The last connection to focus on is the network.

7TH Army LandWarNet

The DOD network is known as the Global Information Grid (GIG), which is the "globally interconnected, end-to-end set of information capabilities, associated processes, and personnel for collecting, processing, storing, disseminating, and managing information on demand to joint forces and support personnel."[66] The GIG is the combination, integration, and synchronization of the Defense Information Systems Network (DISN) and the separate Service Enterprise Networks including Army LWN.[67] The DISN consists of the transport infrastructure and associated technology to provide seamless interoperability and connectivity between the three segments of the GIG; the operational base (post, camps, and stations), the long haul (strategic) and the deployed (tactical).[68] "The CDRUSSTATCOM, through CDR, JTF-GNO, provides the DoD with the direction and oversight to operate and defend the GIG."[69]

The Army LWN is defined as "The United States Army's contribution to the Global Information Grid (GIG) that consists of all globally interconnected, end-to-end set of Army information capabilities, associated processes, and personnel for collecting, processing, storing, disseminating, and managing information on demand supporting warfighters, policy makers, and support personnel."[70] The Army LWN is not a new network, it is the transformation of the federation of the numerous stove piped Army network's already in existence into a single enterprise with common standards, business practices, and tactics, techniques and procedures (TTPs).[71]

The Army began viewing its infostructure as an enterprise network 2001.[72] To achieve this, the Army implemented two transformational measures. First, on 9 July 2002, the Army integrated the duties of the Chief Information Office (CIO) underneath the Army G6 and made

the position dual hatted as Army G6/CIO.[73] Second, on 11 July 2006, the Army established the Network Enterprise Technology Command/ 9th Army Signal Command (NETCOM/9th SC (A)) "as the single authority to operate, manage and defend the Army infostructure at the enterprise level."[74] The Army LWN provides the net-centric environment for the modular forces to operate throughout the six phases of the joint operation model.[75] LandWarNet is "the means to provide linkages between sensors, shooters and leaders; seamless and secure interoperability; network services; and, end-to-end connectivity throughout the enterprise."[76]

NETCOM delegates the responsibility of both enterprise and network operations to the theater signal commands for their respective theaters.[77] In the European Command (EUCOM), 5th Signal Command is responsible for the Army in Europe's portion of the LWN- the 7th Army LWN. The 7th Army LWN transformed into a single network consisting of operational base, strategic, and tactical infostructure- centrally controlled and regionally managed. This concept "provides a seamless transition to the warfighter/customer from the garrison environment to the deployed/tactical environment."[78] Two major endeavors enabled this transformation. The first was the Army SDAP (V.1) published in March 2006. The Army SDAP directed all Army theater signal commands to establish a C4IM single service provider for all Army elements in the theater, and to consolidate all unit servers in centrally managed network enterprise facilities.[79]

This plan gave the theater signal commands the authority to transition the myriad of unit owned and operated stovepipe networks into a single network and put standards in place for common C4IM services.[80] The Army SDAP also gave 5th Signal Command the authority to establish theater wide consolidated data centers referred to as Area Processing Centers (APCs). This enabled 5th Signal Command to centrally host, control, and manage all 7th Army theater application and data servers at four separate APCs throughout the EUCOM AOR.[81] The second

major action was the addition of the Regional Hub Node (RHN) to the DISA Strategic Tactical Entry Point (STEP) site at Landstuhl, Germany, and the receipt of the RHN certification of networthiness on 30 May 2008.[82]

The primary mission of the RHN is to connect tactical JNN equipped formations to the 7th Army LWN; it is an Army owned satellite teleport configured to terminate tactical satellite circuits and connect numerous types of tactical satellite platforms.[83] The RHN allows tactical JNN users to connect and draw standard Army C4IM services such as SIPR, NIPR, voice over internet protocol (VOIP) and defense switch network (DSN) enabling 5th Signal Command to control the mission.[84] The implementation of the Army SDAP, APC, and RHN combined three networks (operational base, strategic, and tactical) into one 7th Army LWN with 5th Signal Command as the C4IM single service provider.[85]

The Current 7th Army LWN framework consists of three key elements: network transport, network C4IM services, and network operations (NetOps).[86] 2d Signal Brigade controls and provides oversight on the operational base (post, camp, and station) transport, and the strategic (RHN) transport.[87] The 7th Signal Brigade provides tactical transport. The six operational base signal battalions are responsible for and provide oversight on the network transport (cable, fiber, and microwave) in their assigned regions.[88] They are the direct link between the network and the warfighter for network issues in their assigned regions. The strategic transport mission (RHN), resides with the 43d Signal Battalion since the RHN operates in the battalion's region of assigned responsibility.[89] Units requesting to connect to the RHN submit their request to the USAREUR/7th Army CIO/G6 and G3 for approval. Upon approval, the request is submitted to the 5th Signal Command G3 who coordinates the request with the E-TNOSC (responsible for NetOps), the RHN (to connect), and the requesting unit.[90]

Similar to transport, 2d Signal Brigade controls and provides oversight on the operational base (post, camp, and station) C4IM services to garrison users. The 7th Signal Brigade provides tactical C4IM services to 7th Army tactical warfighters. The six operational base signal battalions are responsible for C4IM services and customer support in their respective regions. The operational base signal battalions are the interface with the warfighter in each region and coordinate with the 5th Signal Command G3 Enterprise Service Office (ESO) and the CIO/G6 IT Theater Business Office (TBO) to establish a service level agreement (SLA) for C4IM services.[91] Once approved, the 2d Signal Brigade ETNOSC establishes the C4IM service baseline from the APC to the warfighter as part of its NetOps mission set.[92] Upon completion, the E-TNOSC Enterprise Service Desk (ESD) provides 24/7 C4IM and network help desk support to the warfighter.[93] If an issue cannot be resolved remotely, the operational base signal battalion in the respective region coordinates onsite desk-top support to the warfighter.[94] Although The E-TNOSC controls the APCs remotely, the operational base signal battalions have overall responsibility for the facilities in their respective AORs.

2d Signal Brigade provides 24/7 NetOps of the 7th Army LWN through the E-TNOSC. The E-TNOSC operates and defends the 7th Army LWN and includes enterprise management, content management, and network defense.[95] "The E-TNOSC operates, manages, administers and defends the Army portion of the European theater information grid and delivers seamless Information Technology capabilities in support of all European theater Army organizations."[96] The E-TNOSC has a support relationship with TNC and AGNOSC depending on the network event.[97] The 5th Signal Command G3 provides oversight on all network actions and operations.

The 7th Army LWN is a single network which provides C4IM services across numerous levels of command authority and boundaries to include operational base, strategic, and tactic.

The Army identified network and C4IM service issues associated with the Army Force Generation (ARFORGEN) cycle and the six phase joint operations model.[98] In each ARFORGEN cycle or phase of the joint process, units had to re-coordinate and reestablish network support- usually ending up with different C4IM services and profiles during each cycle or phase. To provide a more seamless and responsive network to the warfighter, the Army released the draft Network Service Center (NSC) CONOPS (V8) dated 27 May 2008.

> The NSC is the standardized operational processes and procedures that will enable each SC(T) to integrate, synchronize, and deliver voice, data, imagery, applications, networks, and NetOps capabilities down to the individual in both the operating force and generating force across all echelons and through all phases of Joint operations.[99]

The NSC is not an organization, but a process for each theater signal command to optimize the coordination, synchronization, and operations between the theater TNOSC, APCs, and RHN.[100] Each theater NSC will coordinate all intra-theater network actions, and coordinate with other theater NSCs to coordinate inter-theater network actions to provide standardized transport and C4IM services to units deploying between theaters. The NSC matrixes critical decision makers throughout the network, regardless of echelon or organization, to rapidly assimilate network information and rapidly implement required actions. The NSC is a process or virtual organization focused on fixing an "Army enterprise of multiple stove-piped processes, networks and systems, a lack of standardized processes and procedures both within theaters and across theaters, and insufficient enterprise capabilities."[101] The draft NSC CONOPS states the importance of network training assets (modeling and simulation) but does not discuss TRO of the network.

Although command relationships and authority, and organizational structure and functions are connected to provide C2 of the network, including TRO, there are also many

disconnects in these areas. These disconnects revolve around a vertical and echelon based command and control structure, supporting a persistent and continuous system which does not adhere to command, organizational or echelon based boundaries.

Chapter Two (The Disconnects)

Command Relationships and Authority

TRO is an authority inherent to command authority of organic, assigned, or attached forces; and is also inherent to ADCON. It is the authority a commander has to provide training and readiness oversight over assigned and attached subordinate commands and is executed echelon to echelon through the vertical chain of command. The USAREUR/7A Commander has TRO authority over all USAREUR/7A MSCs, while the USAREUR/7A MSCs and subordinate commands have TRO authority over their organizations. This authority focuses on the training and readiness of individual units and commands. The 7th Army LWN is not a unit or organization; it is a net-centric system comprised of many commands and units and cuts across command and organizational boundaries.

Prior to the transformation process of USAREUR to 7th Army, and the establishment of the 7th Army LWN, network TRO was not disconnected because unit commanders owned their own networks and a single theater network did not exist. An example of this in USAREUR/7A was the corps centric structure. Corps commanders provided TRO to subordinate commands, including assigned divisions, through the chain of command. Likewise, division commanders provided TRO to subordinate commands, including assigned brigades, through the chain of command. Under this corps model, TRO of the network was not disconnected because the network assets were organic and resided within the corps chain of command. There was no single network; the network was organic to each echelon of command so TRO focused on individual commands and units including the network resident to each organization.

The 7th Army LWN, by definition, consists of "the interconnected, end-to-end set of Army information capabilities, associated processes, and personnel for collecting, processing, storing, disseminating, and managing information."[102] This definition is based on functions, capabilities, and processes; not individual units or commands. The current TRO process focuses on the training and readiness of each individual command or unit comprising the 7th Army LWN. 7th Army LWN requires a TRO process which treats the network like a weapon system and focuses on the entire system, not the individual pieces and parts (units and organizations) which comprise the system. This is a difficult task because the system is based on a network-centric hierarchy and TRO authority is based the vertical chain of command and an echelon based organizational hierarchy.

The 7th Army LWN spans across organizational command boundaries and echelons; and combines strategic, operational base, and tactical networks. In the current command structure and organizational hierarchy who has the authority for TRO of the 7th Army LWN? It depends where you sit. The modular brigade commanders have TRO over the brigade's organic JNN Company because TRO is inherent to their command authority. The 5th Signal Commander has TRO over 5th Signal Command assets based on command authority; and has NetOps authority over all assets connected to the 7th Army LWN.

In addition, the USAREUR/7A Commander has OPCON, ADCON and title-10 authority over all Army elements in EUCOM to include 5th Signal Command and the CIO/G6 provides staff oversight on C4IM TRO issues on behalf of the USAREUR/7A Commander. NETCOM/9th SC (A) shares ADCON with USAREUR/7A over the 5th Signal Command, and NETCOM/9th SC (A) has technical enterprise level authority over the entire Army LWN. Finally, USSTRATCOM, through the JTF-GNO, has OPCON of the GIG for critical NetOps events

when deemed necessary to counter cyber threats. The question then becomes how to effectively implement TRO of the 7th Army LWN?

The 5th Signal Commander is in the best position to implement effective TRO over the 7th Army LWN because the majority of the network assets are in the 5th Signal Command. However, the 5th Signal Commander currently has split levels of TRO authority over the network which creates another disconnect. The Commander, 5th Signal Command has direct TRO authority over the 5th Signal Command assets and the fixed station infrastructure of the 7th Army LWN. As the USAREUR/7A CIO/G6, the Commander, 5th Signal Command has TRO authority, on behalf of the USAREUR/7A Commander, over the 7th Army LWN when dealing with USAREUR/7A organizations connected to the network but outside of the 5th Signal Command chain of command. In other words, the 5th Signal Commander has the vested authority to have continuity of TRO across the 7th Army LWN, but the supporting staffs are at different echelons and are acting on different levels of authority.

This is the classic industrial age C2 model where there is a vertical chain of command and specialized staff functions at each echelon which limits and stovepipes information flow and decision making.[103] This model works but TRO is approached from a command, echelon and unit view not a net-centric view of the entire network. In this model, TRO is executed through the chain of command. "This view of command could be characterized as power to the center. Systemic faults found in organizations of this type include the mismatches that frequently occur between responsibility and authority and the great disparities that often exist among levels of awareness that lead to a lack of effectiveness and agility."[104]

The same authority issue also creates a TRO disconnect between the six operational base signal battalions, under 2d Signal Brigade, and the units (customers) they support within their

regions. Under the SDAP, these battalions are responsible for providing oversight and support of the 7th Army LWN infrastructure in their assigned regions. They are also responsible for providing oversight on operational base C4IM services to the warfighters in their respective regions. Authority for this support originates from the SDAP. However, because the supported units in each region are not in the battalion's chain of command, they do not have the authority to provide TRO of the network with the supported units. Although the operational base signal battalion commanders are on ground and are the subject matter experts (SMEs) for the 7th Army LWN in each region, TRO on network issues outside of the 5th Signal Command comes from the USAREUR/7A G3, and the CIO/G6 staff. The operational base signal battalion commanders and the USAREUR/7A CIO/G6 staff all work for the 5th Signal Commander; but disconnects in current command relationships and authorities prevent this interaction.

Organizational Structure and Functions

In addition to command relationship and authority issues with TRO and the network, organizational structure and functions also create disconnects. Because 5th Signal Command is horizontal in the chain of command to most of the network users in USAREUR/7A, multi-echelon coordination is required for network training and readiness issues. A request for network training support requires coordination from the warfighter organization up to USAREUR/7A Headquarters; from USAREUR/7A Headquarters back down to 5th Signal Command; and then between 5th Signal Command and the warfighter organization. This disconnect is caused by a net-centric network, supported by a multi echelon vertical command and organizational structure. Combining the network staff functions from the various echelons into a single staff organization is achievable, but would create authority issues executing the proper staff functions at the proper command echelons. The Joint CONOPS for NetOps addresses this issue.

> NetOps faces the same set of hierarchical C2 complexities as any other joint force operation. To facilitate net-centricity, NetOps must adopt new Information Age C2 structures and processes that breed self synchronized support for effective operations and defense of the GIG. Today technology does not support effective operations and defense of the GIG from one centralized headquarters.[105]

The process of network TRO is executed by 5th Signal Command over 5th Signal Command assets and by USAREUR/7A for network assets outside of the 5th Signal Command chain of command. The current TRO authority, a multi-level organizational structure, and staff functions separated by echelon create disconnects and a fragmented TRO approach to the network. This process provides effective TRO of individual units, but does not provide a combined look at the collective training and readiness requirements across the entire network. The current process

does not treat the network as a weapon system and TRO is executed from a unit perspective, not a network or net-centric perspective.

The 5th Signal Command provides TRO over 5th Signal Command organizations. The USAREUR/7A CIO/G6 staff provides C4IM TRO, delegated by the USAREUR/7th Army Commander, over all USAREUR/7A MSCs. In addition, warfighters requiring network support and training have to transverse three echelons of command- requesting unit, USAREUR/7A Headquarters, and 5th Signal Command. This wastes time, fragments the process, and effectively creates a stove piped staff process. The 7th Army LWN is a horizontal system supported by a vertical organizational hierarchy. Effective TRO of the 7th Army LWN requires the combination and assimilation of 2d Signal Brigade and 7th Signal Brigade organizational structure and staff functions; 5th Signal Command organizational structure and staff functions; USAREUR/7A organizational structure and staff functions; and NETCOM/9th SC (A) organizational structure and staff functions. However, this would violate the current command relationships and authorities in place to support a network which is rapidly transforming.

TRO and the 7th Army LandWarNet

While the Army force structure, command relationships, and organizations in Europe continue to transform, the network has transformed in every aspect. The SDAP and the RHN have transformed and combined a federation of unit owned and stove piped strategic, operational base, and tactic networks into a single network. The SDAP established a network enterprise and designated 5th Signal Command as the C4IM single service provider including a centralized help desk. The implementation of the APCs consolidated the myriad of Army unit servers and data storage devices scattered across the EUCOM AOR into five centrally managed facilities. This transformation created a flexible, reliable, defendable, and robust network which 5th Signal Command could effectively manage. However, with any transformation disconnects were identified between the network, organization, and doctrine. The Army draft NSC CONOPS identifies this issue.

> There are a number of gaps that exist today between what is required by both the operating forces and the generating forces, and what is currently provided. Some of these gaps are caused by technology, some by organizational issues, and some by doctrinal inconsistencies.[106]

The 7th Army LWN has finally evolved into single enterprise architecture with a central framework consisting of the E-TNOSC, APCs, and RHN. The disconnects associated with the 7th Army LWN have to do with command relationships and multi echelon organizational structures which support the network. This specifically impacts network TRO since it is an authority and the network spans across all levels of authority. TRO of the network becomes a bigger issue when discussing how to provide network and C4IM services to Army units in the ARFOGEN Cycle and impacts all Service components when discussing how to provide

operational base, strategic, and tactic network C4IM services to units throughout the six phase joint model. This makes TRO of the network a Service component and Joint issue.[107]

To make the LWN more responsive to the warfighter, the Army has developed the concept of the NSC. The NSC concept works through the bureaucracy, caused by levels of authority, and organizational structure, to synchronize the three critical network functions (transport, C4IM services, and NetOps). This process provides a responsive network and reliable C4IM services to tactical, strategic, and operational base warfighters. Once the NSC process is implemented in each theater, each theater NSC will coordinate with other theater NSCs to effectively move units across theater boundaries with the identical network support and services. The NSC concept matrixes key staff functions across several echelons of command to synchronize network operations intra-theater and inter-theater across the entire LWN.

The NSC is not an organization structure but a process revolving around a virtual organization to quickly assimilate critical information across command boundaries and echelons and enable rapid decision making. The NSC is the exact process required for effective network TRO to overcome disconnects created by command authority and a multi-echelon organizational structure. However the draft Army NSC CONOPS focuses around network operations and service delivery, and does not specifically address TRO of the network.

The current command and control mechanisms connect command relationships and authority; and organizational structure and functions with the network. However, these same mechanisms create disconnects with TRO and the network. Why is this and why does the Army NSC CONOPS solve some of these issues?

The Nexus- Industrial Age C2 Meets Information Age C2

The 7th Army LWN is the nexus where industrial age military organizational structures collide with an information age C2 system. The 7th Army LWN is a net-centric information age C2 system supported by an industrial age organization consisting of vertical command and control echelons and stove piped staff process:

> Industrial Age military organizations have evolved into many-layered hierarchies populated with stovepiped organizations and centralized planning processes. Organizational entities that are not in the same stovepipe do not share information, nor do they normally work with one another……Furthermore, individuals and organizational entities with Industrial Age mindsets do not see a compelling need for interoperability. Instead they think it is more important that they or their organization configure their systems and processes to optimize the task for which they are responsible.[108]

This describes the NETCOM/9th SC (A) and USAREUR/7A command relationships and authority, and organizational structure and functions as they apply to the 7th Army LWN.

The 7th Army LWN is a net-centric system which requires a flexible, agile, and responsive supporting C2 structure to effectively operate, sustain, train, resource, and synchronize all assets across the entirety of the network. In *Power to the Edge*, Alberts and Hayes describe an information age C2 process as a process that transcends command echelons, organizational boundaries, and specialized staff channels to ensure: the right decision makers are connected; information is posted and pulled when required; and command relationships, organizational structures, and stovepipe command channels do not hamper agile decision making.[109] This process is known as power to the edge and can function simultaneously and parallel to an industrial age C2 process in the same organization.[110] The proposed Army NSC meets the definition as a power to the edge C2 process. The NSC cuts through the complex myriad of command authorities involved with the network and spans through the numerous

levels of organizational structure and echelons of staff to effectively coordinate and synchronize network operations. This is the exact process required to implement effective and efficient network TRO, both intra and inter-theater.

Chapter Three (Recommendations-The Way Ahead)

While USAREUR transforms to 7th Army, the networks supporting USAREUR/7A have merged under central management and control to form the 7th Army LWN. While these transformations take place, disconnects between command authority, organizational structure, and network TRO still exist:

> To become an Information Age organization, a military organization will need to fundamentally change their approach to command and control. This means that they will need to change the way they think about information and its dissemination, and about accomplishing tasks, organizing, and training. This also means that they need to explore new interactions among individuals and organizations and develop new processes.[111]

The TRO process and the network were once aligned under the same command authorities and organizational structures, but now fall under numerous and separate command authorities and organizations- TRO of the network and the network are disconnected.

The industrial age military C2 which connects command authority, and organizational structure to the network, also creates disconnects with TRO of the network.

Numerous commanders and organizations have some level of TRO responsibility for the 7th Army LWN including EUCOM and USAREUR/7A for daily operations; NETCOM/9th SC (A) for enterprise level operations; USSTRATCOM, USASMDC/ARSTRAT, and NETCOM/9th SC (A) for NetOps; and a myriad of commands and organizations who are user customers on the network. However, 5th Signal Command (including 2d Signal Brigade and 7th Signal Brigade), and the Commander, 5th Signal Command have TRO across all of these areas and are in the best position to provide "end-to-end TRO of the 7th Army LWN", but remain constrained by lines of authority, and organizational functions separated by both structure and echelons of command. This creates a piecemealed, bureaucratic, and unsynchronized process towards TRO of the

network. The implementation of three actions would improve TRO of the network without negatively impacting TRO in other areas.

First, establish a Network-TRO Directorate. USAREUR/7A conducts TRO through an industrial age military C2 system based on a vertical and hierarchical command authorities and stovepiped and multi-echelon control processes. From a commander's perspective this approach is not only effective but required. However, from a network viewpoint this is a piecemeal and ineffective approach to provide TRO of a net-centric system- the 7th Army LWN. TRO is currently executed through the vertical chain of command and is focused on individual units. Similarly, TRO of the network is currently conducted unit by unit.

A single agency responsible for the synchronization and coordination of TRO across the entire 7th Army LWN does not currently exist. A holistic view of TRO is required to treat the network as a weapon system and conduct TRO focusing on the entire system not a collection of sub-systems. This is not merely TRO of the network, but is "network-TRO" and truly focuses on the end-to-end network as a system. This does not advocate replacing the current TRO process, but enhancing the current process by adding an information age network-TRO process in addition and in parallel to the industrial age military TRO process already in place.

To execute network-TRO, 5th Signal Command should establish a Network-TRO Directorate. This position would not replace the current organizational staffs already in place, but would utilize the network to establish a virtual syndicate or cell to work in parallel with the existing organizational structures. While the current staff organizations are command, echelon, and organizationally focused, the Network-TRO Directorate would focus on synchronizing and coordinating network-TRO to support training (exercise support), enable training (connect), provide training (online training, modeling, simulations), and would also include receiving

training (training of the network). The directorate position and a small support staff would be permanent positions. The rest of the Network-TRO Directorate would consist of personnel matrixed in from other organizations. This matrix or virtual concept is further discussed in the next recommendation.

Second, implement the Network-TRO Directorate as part of the Army proposed NSC process in each theater including the EUCOM AOR. The Network-TRO Directorate should reside under the NSC framework since the NSC concept is based on an information age process which cuts across command authorities and organizational boundaries. This would ensure the directorate focus is not unit based or organizationally constrained, but network focused and fully synchronized with NSC operations. The foundation (director and several permanent staff members) of the Network-TRO Directorate would come from 5th Signal Command, but the majority of the directorate would consist of a virtual matrix or syndicate from 5th Signal Command, USAREUR/7A, NETCOM/9th SC (A), DISA, and EUCOM. Membership would be based on knowledge of network training and readiness requirements, functions, and authority to conduct agile decision making.

Many of the personnel who are part of the NSC process would also makeup the Network-TRO Directorate syndicate, since the NSC process consists of the key network personnel including the E-TNOSC, APC, and RHN. This would greatly improve the coordination and synchronization of Network-TRO and would allow the network to predict, coordinate and synchronize training and readiness events not react to them. This becomes critical once the Army establishes the NSC process in every theater and theater NSCs begin coordinating with one another to provide common network services and training to units crossing theater boundaries. NSCs will coordinate and synchronize strategic, operational base, and tactical

network actions based on the operational and training requirements of units moving into and through theater boundaries.

Third, change the position codes of the six operational base signal battalion commanders underneath 2d Signal Brigade to dual-hatted positions. The dual-hatted position would include signal battalion command along with the duties of regional signal officer for each respective network region in USAREUR/7A. The current industrial age military organizational structure hampers Network-TRO in the six designated Army in Europe network regions (Benelux, Heidelberg, Stuttgart, Grafenwoehr, Hessen, and Vicenza). Each region has an operational base signal battalion as the responsible agent for the 7th Army LWN and C4IM services in each region.

However, the operational base signal battalions are subordinate to 5th Signal Command and the units they support are not in their direct chain of command- they have limited Network-TRO authority with their supported units. Network and C4IM TRO over USAREUR/7A subordinate units, outside of 5th Signal Command, originates from the USAREUR/7A Headquarters. To overcome this, the operational base signal battalion commanders should be dual-hatted as regional signal officers, and a memorandum of agreement (MOA) should be implemented. This would provide the six battalion commanders with the authority required to coordinate and synchronize the Network-TRO mission throughout their respective network regions.

Chapter Four (Summary)

The 7th Army LandWarNet was established as part of the Army plan to provide a net-centric environment for the Army in Europe. Although the USAREUR/7A organizational structure is modular, it is still an industrial age military organization. In contrast, the 7th Army LWN is a net-centric system which cuts across command, echelon, and organizational boundaries associated with the TRO process, requiring an information age C2 process to provide effective training and readiness oversight of the system. The TRO process and the network were once aligned under the same command authorities and organizational structures, but the 7th Army LWN has drastically expanded. This has caused TRO and the network to fall under numerous and separate command authorities and organizations, and created disconnects between the two components of TRO (command authority and organizational structure and functions) and the 7th Army LWN.

Consequentially, the 7th Army LWN is the nexus where an industrial age military C2 structure supports an information age C2 system- 7th Army LWN. TRO of the network is connected to the network through current command authorities and relationships, and organizational structure and functions. However, there are also disconnects which revolve around a vertical and echelon based command and control structure, supporting a persistent and continuous system which does not adhere to command, organizational or echelon based boundaries.

Numerous commanders and organizations have some level of authority, including TRO, for the 7th Army LWN including USSTRATCOM, USEUCOM, USASMDC/ARSTRAT, USAREUR/7A and NETCOM/9th SC (A). However, the 5th Signal Commander is in the best

position to provide "end-to-end TRO of the 7th Army LWN", but remains constrained by lines of authority, and organizational functions separated by both structure and echelons of command. This has created a piecemealed, bureaucratic, and unsynchronized approach towards TRO of the network. Three actions are required to enable an industrial age military organization to provide effective TRO of an information age system (network).

First, establish a Network-TRO Directorate in addition to the current organizational based TRO process. This would synchronize and coordinate TRO of the network from a network perspective, as opposed to an organizational perspective, to enable true end-to-end Network-TRO. Second, add the Network-TRO Directorate as part of the Army proposed NSC process in each theater. This would establish a virtual information age cell focused strictly on Network-TRO and would consist of staff personnel matrixed from across, and not constrained by, command authorities and organizational boundaries. Finally, change the position code of the six operational base signal battalion commanders under 2d Signal Brigade. Make these slots dual-hatted positions to include the duties of regional signal officer for each respective network region. This would allow effective Network-TRO in each network region without the constraints the current command authorities and organizational boundaries impose.

Network technology is currently in place to enable effective net-centric operations. To take full advantage of this technology, information age C2 processes are required. However, attitudes of how we conduct business must change along with culture, command relationships, organizational structure, and doctrine. This is the difference between a revolution in military technology verses a revolution in military affairs. "Thus, individuals at all levels in many organizations will need to be able to work with others both within their organization and with others in a variety of other organizations to collectively exercise the functions of command."[112]

Technology is no longer the limiting factor. Since the 7th Army LWN is a subset of the LWN, and the LWN is a subset of the GIG, similar industrial age military C2 issues, including TRO, span across all networks. Information age C2 processes should be adopted across all service, agency, and DoD networks in order to take full advantage of the technology in place.

End Notes

[1] USSTRATCOM, *Joint Concept of Operations for Global Information Grid NetOps*, 4 August 2006, P. 41. The GIG NETOPS CONOPS defines net-centricity as "A robust, globally interconnected network environment (including infrastructure, systems, processes and people) in which data is shared timely and seamlessly among users, applications and platforms. It enables substantially improved military situational awareness and significantly shortened decision-making cycles."

[2] The United States Army Europe (USAREUR) is currently in the process of transforming to 7th Army (7A). For the purpose of this paper USAREUR and 7th Army will be referred to as USAREUR/7A except where directly quoted.

[3] Joint Chiefs of Staff, Joint Publication (JP) 0-2, *Unified Action Armed Forces (UNAAF),* 10 July 2001, P. GL-5.

[4] Ibid., P. III-1.

[5] Department of the Army Field Manual (FM) 6-02.45 (FM 11-45), *Signal Support to Theater Operations*, dated 12 April 2004, uses the term technical control (TECHCON) when dealing with the authority associated with technical network control. However, this term is not defined or used in JP 1, *Doctrine for the Armed Forces of the United States*, dated 10 July 2001, nor is it listed in JP 6, *Joint Communications System*, dated 20 March 2006.

[6] Joint Chiefs of Staff, Joint Publication (JP) 1, *Doctrine for the Armed Forces of the United States*, 10 July 2001, P. GL-5.

[7] Ibid., P. GL-9.

[8] Ibid., P. GL-5.

[9] Department of the Army Field Manual (FM) 3-0, *Operations*, 27 February 2008, P. B-10.

[10] Ibid., P. B-12.

[11] Joint Chiefs of Staff, Joint Publication (JP) 1, *Doctrine for the Armed Forces of the United States*, 10 July 2001, P. IV-14.

[12] Department of the Army Field Manual (FM) 3-0, *Operations*, 27 February 2008, P. B-12-13.

[13] Department of the Army Regulation (AR) 10-87, *Army Commands, Army Service Component Commands, and Direct Reporting Units*, 4 September 2007, P. 4-5.

[14] The abbreviation (SA) refers to the Secretary of the Army.

[15] Department of the Army Regulation (AR) 10-87, *Army Commands, Army Service Component Commands, and Direct Reporting Units*, 4 September 2007, P. 5.

[16] Ibid., P. 13.

[17] USSTRATCOM, *Joint Concept of Operations for Global Information Grid NetOps*, 4 August 2006, P. 41; defines network operations (NetOps) as "the operational framework consisting of the essential tasks, situational awareness (SA); and C2 that CDRUSSTRATCOM employs to operate and defend the GIG. The essential tasks are GIG Enterprise Management (GEM), GIG Network Defense (GND), and GIG Content Management (GCM). NetOps and its essential tasks GEM, GND, and GCM includes IA as defined and outlined in DODD 8500.1, Information Assurance, and CJCSI 6510.01D, Information Assurance and Computer Network Defense."

[18] Department of the Army Regulation (AR) 10-87, *Army Commands, Army Service Component Commands, and Direct Reporting Units*, 4 September 2007, P. 14.

[19] USSTRATCOM, *Joint Concept of Operations for Global Information Grid NetOps*, 4 August 2006, P. 13.

[20] Joint Chiefs of Staff, Joint Publication (JP) 6, *Joint Communications System*, 20 March 2006, P. IX.

[21] Department of the Army Field Manual Interim (FMI) 6-02.71 (Draft), *Network Operations*, 31 July 2007, P. 3-14.

[22] USSTRATCOM, *Joint Concept of Operations for Global Information Grid NetOps*, 4 August 2006, P. 4.

[23] Department of the Army Regulation (AR) 10-87, *Army Commands, Army Service Component Commands, and Direct Reporting Units*, 4 September 2007, P. 11-12.

[24] Department of the Army Field Manual Interim (FMI) 6-02.71 (Draft), *Network Operations*, 31 July 2007, P. 3-14/15.

[25] Ibid., P. 3-16

[26] USSTRATCOM, *Joint Concept of Operations for Global Information Grid NetOps*, 4 August 2006, P. 39, defines computer network defense (CND) as: "defensive measures to protect and defend information, computers, and networks from disruption, denial, degradation, or destruction."

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